AN EXPLORATORY STUDY ON THE EFFECTS OF AI SONG GENERATION ON AGENCY, AUTHENTICITY, CREATIVITY, AND CONNECTEDNESS

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ABSTRACT

Songwriting supports creative and emotional expression and social and emotional development through emotion regulation and wellbeing, self-esteem, and a stronger sense of identity. Recent advances in AI technology have provided access to music creation even for people without musical expertise, through AI song generation. We conducted an exploratory, single session study to examine these outcomes in participants attending public outreach events. 45 participants with varying musical proficiency were instructed to express themselves creatively and emotionally by 'composing' a song with an AI music generator. They listened to their generated songs and completed a questionnaire measuring song evaluation, task engagement, emotional expression, agency, authenticity, creativity, and connectedness. These exploratory results suggest that more positive attitudes towards AI are related to greater connectedness, while more musical proficiency is related to lower authenticity and evaluation. Agency partially mediated the effects of emotional expression and engagement on authenticity, creativity, and connectedness. These exploratory results can be leveraged for future confirmatory research.

1. INTRODUCTION

Emotion-related disorders, including anxiety and depression, take immense tolls on health and the economy [1]. Any means of supporting social and emotional wellbeing help combat global mental health challenges. Songwriting is an outlet for creative expression and supports various social and emotional goals in therapeutic contexts including emotional expression and regulation, identity development, coping, resilience, and social connection [2]. Songwriting is also an effective tool for promoting social and emotional development in educational contexts, supporting students by building self-confidence, improving emotional wellbeing, and supporting social bonding through stronger classroom communities [3]. Therefore, much research shows the efficacy of songwriting in supporting social and emotional wellbeing.

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Recent developments in artificial intelligence (AI) music technology have led to the popularization of AI music generation. AI technologies provide access to song creation even for individuals with no training or skill in music. Given that songwriting can support social and emotional wellbeing, is it possible that AI song generation could also support some aspects of wellbeing? Generative AI music tools have shown promise for enhancing wellbeing in a variety of settings including for the elderly, healthcare, and in daily life. Older adults may benefit from AI-based music generation for supporting reminiscence and mood [4]. Integration of AI-generated music into patient treatment may support enhanced emotional states, relaxation, and energy levels [5]. AI-generated music may also benefit non-clinical populations by improving mental health, reducing stress, and increasing positive affect [6]. AI-assisted co-creation may support social relatedness, mastery, and autonomy by facilitating creativity between people as the AI would assume administrative and anti-oppressive roles [7]. Other research has taken more critical lenses by highlighting both benefits and risks of AI involvement in personalized healthcare, mental health support, and adaptive education suggesting that while they may facilitate "synthetic" happiness, these tools can lead to over-reliance and replace important human interactions [8]. Further risks that are present in generative AI in general include ethical concerns including copyright infringement, environmental impact, and socio-cultural impacts of homogenization, deskilling, and excessive AI slop [9]. While the benefits of AI music generation may include aesthetic developments, time and cost efficiency, and health and wellbeing applications, greater exploration of risks and benefits within AI music generation is necessary to understand its impacts and to develop policies that support and protect musicians and audiences.

The influence of AI on music composition has been examined in users with a variety of skill levels. Interactive and generative AI-based tools help music producers to reflect critically on their creative process, break habits, and provide refreshing ideas, either by leveraging the tools' intended purposes or their constraints [10]. For novices, AI tools may support confidence during music production and accelerate the preparation phase, but they also introduce time-consuming collaging and refinement phases [11]. Allowing novices to "steer" the AI in the music creative process supported feelings of control, comprehension, self-efficacy, trust, sense of collaboration with the AI, and own-

ership of the composition [12]. However, higher automation of AI in music creation leads to lower feelings of agency (i.e., control over actions and consequences) and the effect is stronger for experts than novices [13].

Several models have been developed to describe the interaction between humans and AI in musical contexts. The Human–AI agency model developed in the context of AI music generation posits that AI-led creation may lead to long-term reduction in curiosity, intrinsic motivation, self-efficacy, domain knowledge, community, and affect through reduced human agency [11]. The embodied AI interaction framework emphasizes that attention and agency interact to influence how performer-perceivers experience embodied AI systems [14]. The access-awareness-agency model of music-based social-emotional competence positions music as a resource for embodied access, reflective awareness, and a sense of agency [15]. Therefore, agency is an important component of the benefits of music and an experience that AI music generation may reduce.

A loss of agency is likely to contribute to a loss in feelings of authenticity. Within musicology, authenticity may refer to several qualities including originality and realness, which is a primarily self-reflective emotional experience for musicians, and a constructed experience for audiences [16]. Creativity is another important concept because it is often cited as one of the defining characteristics of the human species. AI music technologies are poised to transform perceptions of creativity as they claim to offer "augmented" creativity [17]. Debates on the nature of authenticity and its relation to creativity have been ongoing in popular music studies for decades [18]. Technological mediation is often a central component of discussions of musical authenticity [19]. Interestingly, feelings of shared agency facilitated feelings of social connectedness with a musician in a livestreamed concert audience [20]. Therefore, feelings of agency are related to feelings of authenticity, creativity, and connectedness in a variety of technological paradigms within musical practices.

Together this growing body of research shows that feelings of agency are important when examining potential social and emotional benefits of AI music generation. Generative AI technologies can be leveraged to probe the antecedents and consequences of agency in musical expression. Antecedents could be related to the creative process or creative artifact, and can be measured with feelings of task engagement, emotional expression or induction, and evaluations of the creative product through liking, quality, and alignment with creative intentions. Agency may mediate other outcomes of creative expression including authenticity, creativity, and connectedness (Figure 1). Indeed, recent empirical work suggests that more AI automation in music generation decreases agency and this is also related to a decrease in psychological ownership [13]. While He (2026) posits that agency is mediated by psychological ownership, the immediate experiential nature of agency as the felt control of personal actions and consequences makes it more likely that agency mediates psychological ownership. Notably, this direction does not appear to have been tested in He's study.

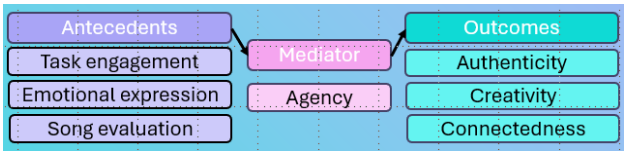


Figure 1. Theoretical Model

1.1 Aim, research question, and hypotheses

This literature inspires the research question: how does AI song generation affect feelings of agency, authenticity, creativity, and connectedness? The aim of this exploratory study was to examine how a single AI song generation would affect these concepts and their relations with song evaluations, task engagement, and emotional expression. We explored the relations of these outcome variables along with demographic variables of musical proficiency and general attitudes towards AI. We also explored whether agency is a mediator of the experiences of authenticity, creativity, and connectedness arising from task engagement, emotional expression, and song evaluations.

We previously reported on a reduced sample of participants in which there were significant differences between musicians and nonmusicians [21]. In this paper, we are reporting on the full sample that includes additional participants collected 7 months later which resulted in group differences becoming non-significant.

2. METHODS

Information including the recruitment poster, questionnaire, codebook, data, generated songs, and detailed statistical analyses are available through the Open Science Foundation repository [1] .

Participants were recruited from two public outreach events (Researcher's Night, September 26th, 2025 and Yläkaupungin Yö Music Festival in May 16, 2026 at the University of Jyväskylä's Centre of Excellence in Music, Mind, Body and Brain). Participants' task was to express themselves emotionally and creatively by making a single prompt in Suno's v5 song generator.

Participants were informed of the aim of the study and consented to participate. Parental consent was obtained for participants under the age of 15. This study was exempt from requiring ethics approval because it did not violate the principle of informed consent as outlined in the TENK guidelines (2019). No personally identifying data was collected from participants.

At the time of the study, Suno was often cited as the leading AI music generator, though the company has been under scrutiny for its unethical practices in model training on copyrighted material.

2.1 Participants

There were 45 participants with various musical interests and proficiency levels ranging in age from 10-71 (see Table 1 for demographics). This study was advertised on

[1] OSF Repository Link

event webpages and by researchers. Participants were recruited from the general public or as members of the volunteer team which consisted of staff and students in the music education and technology programs. Given that we expect the outcomes to be most relevant to people who find music important, we excluded the nonmusicians who reported that they do not love music (n = 2). Therefore, analyses were conducted on the 16 music-loving nonmusicians, 26 musicians, and the participant who did not report their musical proficiency.

Table 1. Demographics variables of the participants. Counts of gender, musical proficiency level, and means of age, hours per week listening to or playing music, and AI attitudes. N: count, M: mean, SD: standard deviation.

Category	N	M	SD
Gender			
Man	29		
Woman	14		
Non-binary	1		
Prefer not to answer	1		
Musical Proficiency			
Nonmusician	2		
Music-loving nonmusician	16		
Amateur musician	10		
Serious amateur musician	6		
Semi-professional musician	5		
Professional musician	5		
Chose not to answer	1		
Outreach Event			
Researcher's Night	36		
Music Festival	9		
Composed Before			
Yes	19		
No	25		
Chose not to answer	1		
Age			
Years		32.31	14.9
Hours per week			
Listening to music		16.38	19.01
Playing music		3.82	5.47
General AI Attitudes			
GAAIS		3.15	0.88

2.2 Procedure

Instructions were provided with the recruitment poster and verbal instructions further emphasized their task was to express themselves creatively and emotionally through the song generation. Participants were informed that it would take approximately 15 minutes, though some participants chose to spend substantially more time on the song generation and filling out the questionnaire.

Participants first completed the demographics section of the questionnaire. Further instructions for AI song generation were presented in the questionnaire. The researcher also provided verbal instructions and a tour through the Suno interface features. They were informed that they should be as descriptive with their prompts as possible and that they would only have one opportunity to press the 'create' button. Two AI-generated songs were created for each prompt (a built-in feature of Suno) and the participant was instructed to listen to the first song and that they could begin filling the post-song part of the questionnaire after they began listening to their second song. They listened to their AI-generated songs on over-ear headphones (Audiotechnica). Participants were offered the link to their AI-generated songs.

2.3 Questionnaire

The questionnaire was designed with some previously validated scales, but most items were created for the purpose of this study. This research approach was chosen in contrast to using validated scales to support probing specific aspects of the constructs of interest during AI song generation and to allow capturing the diverse constructs within the time limits afforded by the outreach events with few items per variable. ChatGPT (University of Oslo GPT-4o mini) was consulted during the questionnaire development to employ the capacities of large language models for item development (asking for item variations and complementary content for our chosen constructs and for assessing grammar). Usage of ChatGPT is indicated in the item descriptions below.

Participants reported demographic information measuring musical proficiency [22], prior experience with music composition and songwriting, and number of hours listening and playing/performing/practicing to music per week. AI attitudes were collected with the 3 highest loading items on the positive and negative subscales from the General Attitudes toward Artificial Intelligence Scale (GAAIS) [23].

During the post-song generation questionnaire, they reported song information including the title and a free text box probing their general impression of the experience. Participants responded to a series of 5-point Likert scales with response poles "strongly disagree" and "strongly agree". They reported song evaluations with quality ratings of the song and production, being happy and impressed with the song, and feeling like the AI helped them achieve what they envisioned for the song (ChatGPT suggestion). They reported task engagement with items probing how invigorating and engaging the song creation process was and how immersed they were during song listening. They reported on emotional expression of the song ("Emotions") with items measuring whether they expressed themselves through the song, whether it communicated their intended emotions, or evoked emotions in them. Agency was collected with items "My input shaped the song", "I had control over the outcome of the song", and "I feel I am the primary creator of this song" (ChatGPT suggestion). Creativity was measured with the items "I feel that I contributed creatively to the song", "I was able to express myself creatively through composing this song", and a ChatGPT suggestion, "The process of creating this song inspired my creativity". Authenticity was measured with

items “This song represents my authentic self”, “Creating this song felt like authentic self-expression”, and “I would be proud to present this song as my own work”. Connectedness was measured with “I felt connected to the song”, “I felt connected to my AI co-creator”, “If I played this song for others, they would feel connected to me”, and “I would share this song with friends or family”. ChatGPT further suggested capturing inspiration with the items “This experience made me want to compose music with an AI again in the future” and “I am inspired to create more music after this experience.” Participants also reported on how listening to the AI co-created song compared to their normal music listening with single items probing liking, quality, engagement, strength of felt emotions, agency, creativity, authenticity, and connectedness. Finally, participants who reported having previous music composition experience also evaluated the same concepts in comparison to their experience during their own musical compositions. Screenshots of the questionnaire are provided in the OSF repository.

2.4 Statistical Analysis

Analyses were conducted using the R Statistical language (version 4.5.2; R Core Team, 2025).

Cronbach’s alpha was used to assess if items developed to measure the main variables in the study had good internal consistency. Item-total correlations (ITC) were used to assess how well an item fits with the other items. Alpha values above 0.7 and ITC $>$ .30 are considered adequate (see Table 2 for reliability statistics and the minimum ITC).

Table 2. Reliability of Constructs

Variable	N Items	Alpha	Min. ITC
Evaluation	5	0.87	0.51
Engagement	3	0.83	0.62
Emotions	3	0.85	0.63
Agency	3	0.74	0.52
Authenticity	3	0.84	0.60
Creativity	3	0.91	0.80
Connectedness	4	0.85	0.60

All constructs demonstrated adequate alpha, therefore the items were averaged into composite scores. Given conceptual distinctions between items related to inspiration to create music (with and without AI assistance), these items were not averaged together and were analyzed as single items. Single items may suffer from reduced validity so results should be interpreted with caution.

Given the exploratory nature of the research, we corrected for multiple comparisons with the FDR method for each set of tests that were performed. To examine the relations between outcome measures and the demographics of musical proficiency and AI attitudes, we conducted pairwise Kendall correlations.

Multivariate multiple regression was conducted to assess if agency, authenticity, creativity, and connectedness were explained by song evaluation, task engagement, or emotional expression.

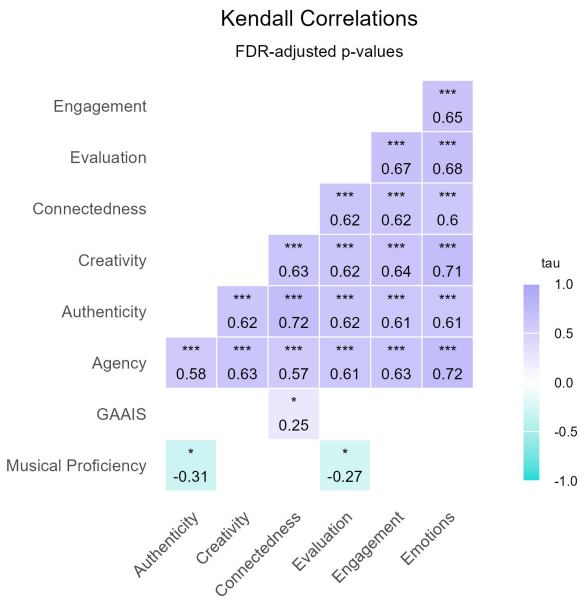


Figure 2. Kendall correlations corrected for multiple comparisons with FDR corrections. $*p < .05$, $**p < .01$, $***p < .001$. Non-significant correlations are not displayed.

A nonparametric bootstrap mediation analysis was conducted with 5000 resamples to assess if agency mediated the effects of engagement and emotional expression on authenticity, creativity, and connectedness.

To examine the effect of being a musician or a nonmusician on outcome measures, participants were categorized based on their responses to the musical proficiency item. The participant who did not respond to this item was not included in these analyses.

A MANOVA was used to compare musicians and nonmusicians. To examine if groups reported values that were significantly different from the scale midpoint, one sample t-tests were conducted separately for each group (musicians and nonmusicians), and FDR-corrected for the 14 tests. To assess single items, which would violate the assumptions of parametric statistics, we used nonparametric tests including Wilcoxon rank sum tests to compare between musicians and nonmusicians and one-sample Wilcoxon signed-rank tests for assessing differences from the scale midpoint.

3. RESULTS

The Kendall correlations indicated that the outcome measures were all significantly correlated with each other and some outcome measures were correlated with demographics variables (see Figure 2). Musical proficiency was negatively correlated with authenticity and evaluation. General attitudes toward AI were correlated positively with connectedness.

Multivariate multiple regression indicated significant effects of engagement, Pillai’s trace $V = 0.29$, $F(4, 36) = 3.68$, $p = .013$, and emotions, $V = 0.72, F(4, 36) = 4.74, p = .004$, but not evaluation, $V = 0.074, F(4, 36) =$

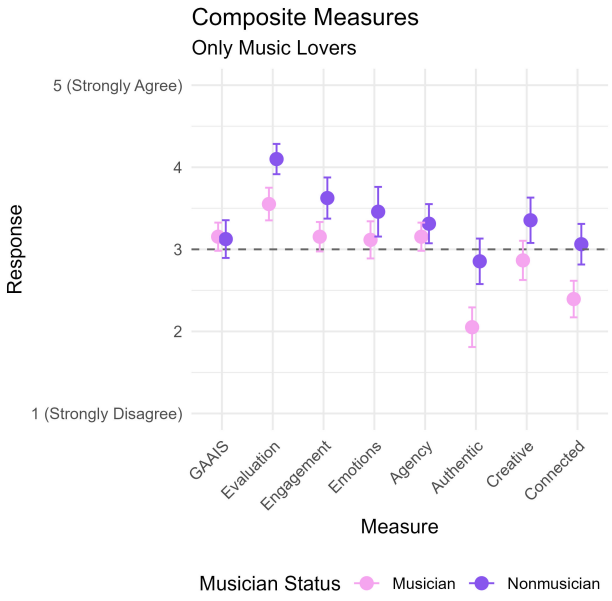


Figure 3. Musicians versus nonmusicians on composite score variables. The points represent the mean and the error bars represent the standard error of the mean.

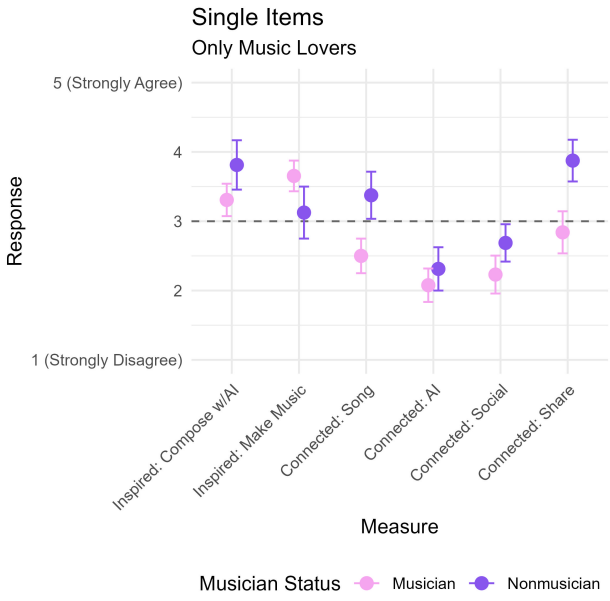


Figure 4. Musicians versus nonmusicians on single items.

$0.72, p = .58$, on agency, authenticity, creativity, and connectedness. Follow-up regression analyses showed that higher engagement significantly explained higher agency, $\beta = 0.34, SE = 0.13, p = .012$, authenticity $\beta = 0.48, SE = 0.21, p = .032$, creativity, $\beta = 0.58, SE = 0.17, p = .002$, and connectedness, $\beta = 0.47, SE = 0.17, p = .01$. Emotions explained agency $\beta = 0.46, SE = 0.12, p < .001$, and creativity $\beta = 0.54, SE = 0.16, p = .002$. Song evaluation did not predict any outcome (all $p > .29$). The regression models explained substantial variance in the outcomes (agency: $R^2 = .70$; authenticity: $R^2 = .56$; creativity: $R^2 = .71$; connectedness: $R^2 = .65$). The mediation analysis revealed that agency partially mediated the effects of engagement and emotional expression on authenticity, creativity, and connectedness (see Table 3).

A MANOVA comparing music-loving nonmusicians and musicians was not significant (Pillai's trace = 0.21, approx. F(7, 34) = 1.32, p = .27). See Figure 3 for average outcome measures.

To assess what outcome measures were significantly different from the scale mid-point for musicians and nonmusicians, we conducted a series of post-hoc one-sample t-tests. Nonmusicians reported significantly above the scale midpoint on evaluation, $p_{\text{FDR}} < .001$, and trending for engagement, $p_{\text{FDR}} = .070$. Musicians reported significantly above the scale midpoint on evaluation, $p_{\text{FDR}} = .041$, and below the midpoint on measures of authenticity, $p_{\text{FDR}} = .004$, and connectedness, $p_{\text{FDR}} = .041$.

Given that the composite score of connectedness measures different facets of connectedness, we wanted to examine each item separately. Similarly, items examining whether participants felt inspired to make more music with or without AI assistance were conceptually distinct. Therefore, items measuring connectedness and inspiration were analysed as single items using non-parametric statistics. Single items may suffer from reduced validity so results should be interpreted with caution. Wilcoxon rank sum tests indicated that there were no significant differences between musicians and nonmusicians (see Figure 4). To assess if single items were significantly different from the scale mid-point for musicians and nonmusicians, we conducted a series of one-sample Wilcoxon signed-rank tests. Musicians reported significantly higher than the midpoint that they were inspired to make music, and significantly below the midpoint on feeling connected to the AI co-creator, $p_{\text{FDR}} < .05$. Trending differences from the midpoint included nonmusicians wanting to share the song, p_{FDR} = .070, and musicians feeling like others would not feel connected with them if they shared the song, p_{FDR} = .066.

Participants reported on how listening to their AI song compared to normal music listening with several single items aiming to probe agency, authenticity, connectedness, creativity, felt emotions, engagement, and evaluation (average of liking and quality). There were no significant differences between musicians and nonmusicians, but there were trends for musicians reporting lower agency, authenticity, creativity, and emotions, $p_{\text{FDR}} < .10$. When examining differences from the scale midpoint, the nonmusicians reported significantly lower evaluation than the midpoint, $p_{\text{FDR}} < .036$, and the musicians reported being significantly lower from the midpoint on every item, $p_{\text{FDR}} < .001$ (see Figure 5).

There were 15 musicians and 4 nonmusicians who reported composing music before the experiment. The small sample of nonmusicians explains the large standard errors and therefore no analysis was conducted on the nonmusicians. Musicians' responses were compared to the scale midpoint using one-sample Wilcoxon tests. Musicians re-

Table 3. Mediation analysis results: Agency as mediator of engagement and emotions on authenticity, creativity, and connectedness.

IV	Mediator	DV	ACME [95% CI]	p	ADE [95% CI]	p	Total Effect [95% CI]	p	Prop. Mediated [95% CI]	p
Engagement	Agency	Authentic	0.49 [0.14, 0.84]	.005	0.42 [0.09, 0.76]	.012	0.92 [0.65, 1.18]	$< .001$	0.54 [0.19, 0.89]	.005
Emotions	Agency	Authentic	0.45 [0.10, 0.80]	.012	0.32 [0.00, 0.64]	.047	0.77 [0.54, 0.99]	$< .001$	0.59 [0.15, 1.00]	.012
Engagement	Agency	Creative	0.40 [0.13, 0.64]	.007	0.59 [0.33, 0.89]	$< .001$	0.99 [0.80, 1.18]	$< .001$	0.41 [0.14, 0.64]	.007
Emotions	Agency	Creative	0.34 [0.02, 0.61]	.038	0.50 [0.24, 0.83]	.001	0.84 [0.69, 0.99]	$< .001$	0.40 [0.03, 0.71]	.038
Engagement	Agency	Connected	0.38 [0.05, 0.66]	.022	0.51 [0.22, 0.85]	$< .001$	0.89 [0.68, 1.10]	$< .001$	0.43 [0.07, 0.73]	.022
Emotions	Agency	Connected	0.35 [0.05, 0.61]	.021	0.38 [0.12, 0.70]	.004	0.73 [0.55, 0.94]	$< .001$	0.48 [0.08, 0.82]	.021

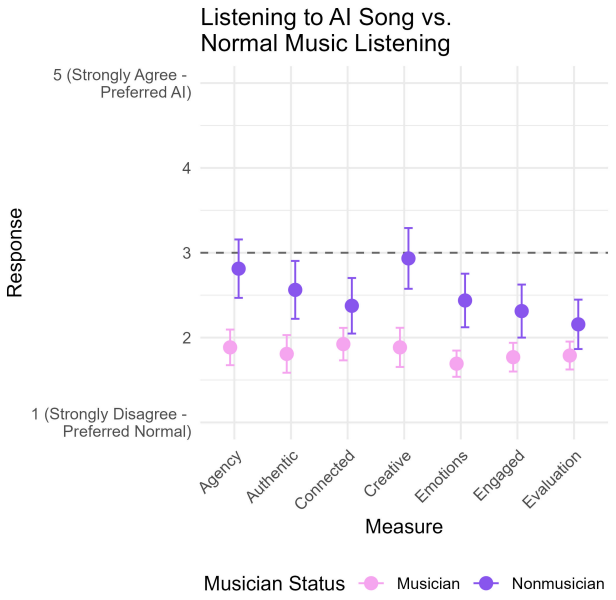


Figure 5. Participants compared their experience listening to their AI co-created song versus normal music listening on several single items.

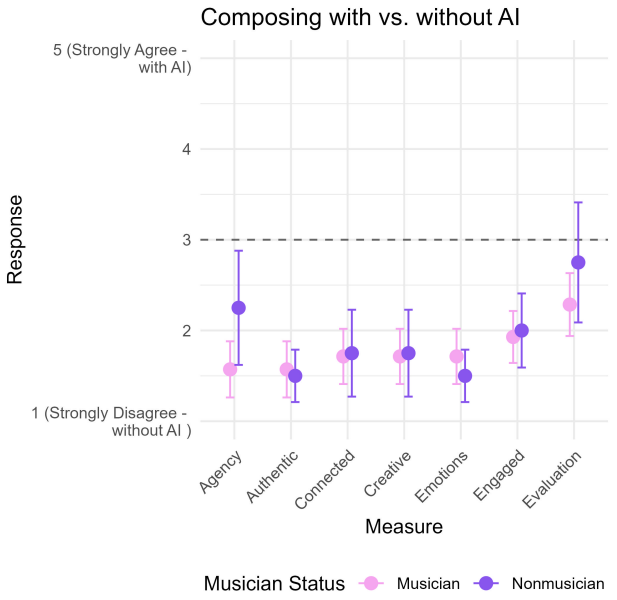


Figure 6. Participants compared their experience composing with the AI versus composing without the AI on several single items.

ported significantly below the scale midpoint on all measures, $p_{\text{FDR}} < .05$ (see Figure 6).

4. DISCUSSION

This study explored feelings of agency, authenticity, creativity, and connectedness evoked by a single bout of AI song generation on the Suno platform (v5) in musicians and nonmusicians. Our findings suggest that experiences of agency, authenticity, creativity, and connectedness were interrelated along with song evaluation, task engagement, and emotional expression. Demographics of musical proficiency and general attitudes towards AI were correlated with outcome measures such that more musical proficiency was related to lower feelings of authenticity and lower song evaluations, while more positive general attitudes to AI were related to more connectedness.

This study contributes to the human–AI Agency in Co-Creation [11] and the Access-Awareness-Agency [15] models by showing that agency is related to and partially mediates the effects of engagement and emotional expression on authenticity, creativity, and connectedness. Our findings support the argument that agency is an important experience for the social and emotional benefits of musical creative expression. However, the partial mediation implies that there are other aspects of experience that contribute to these constructs in addition to a sense of control over creative actions and outcomes. Authenticity was correlated with musical proficiency implying that prior experiences with creative expression may moderate agency's effects on these wellbeing outcomes. Moreover, the novelty of a single song generation may motivate some participants to report higher connectedness through their interest in sharing with others. Furthermore, song generation may inspire creativity through unsatisfied creative expression arising from a lack of agency. There was no effect of song evaluation on agency, authenticity, creativity, and connectedness highlighting that the creative process is more important than the creative outcome for these experiences.

There were no significant differences between musicians and nonmusicians, however musicians reported significantly below the scale midpoint on authenticity and connectedness, while both musicians and nonmusicians reported above the scale midpoint on song evaluation. Musicians also reported feeling inspired to make music after the AI song generation, possibly because their creative interest was piqued but not fulfilled, or due to their typical affinity for this activity. Musicians also reported low connect-

edness to the AI co-creator. Compared to normal music listening, musicians rated all outcomes of listening to the generated song as worse, while nonmusicians only gave a poorer score on evaluation. Similarly, musicians with previous experience composing rated the experience of song generation as worse than their previous experiences composing music. This is likely attributable to how AI song generation does not offer the same benefits as music with which one has a personal connection already. Music is an inherently social activity and even solitary music listening implies the presence of others [24]. But when that music is generated by AI rather than the result of an artist, it does not hold the same significance. This is especially true for those people whose identity is shaped by their musicianship and who have previously experienced the power of musical composition for self-expression and emotional processing.

Free-text comments reflected mixed experiences with one nonmusician expressing glee "Really fancy, I cannot wait to share the song with my family and friends," and another begging to generate more songs. However, one nonmusician described concerns, "Lot of ethics to ponder about this," and others expressed disappointment with the outcome "I was a bit bummed out that it didn't turn out the way it sounds in my head."

4.1 Limitations

Results should be interpreted as preliminary given the small, convenience samples and single-bout design. Additionally, the constructs were measured with self-made items rather than validated scales, so these results should be interpreted with caution and future research should aim to use previously validated scales. This study only examined one AI music generator and so the generalizability to other platforms should be explored in future research. Future research should aim to use larger samples, compare song generation to actual songwriting and composition, and test multiple AI systems. Examination of the longitudinal effects of song generation on authenticity, creativity, and connectedness are also important for understanding long-term effects. Given the ethical concerns with Suno, some participants may have had biases against this particular software which we did not capture and this could have introduced a confound. Therefore, future research should aim to use models for music generation that promote sustainable, ethical, and equitable practices.

5. CONCLUSIONS

This exploratory study showed that a single bout of AI song generation did not support feelings of agency, authenticity, creativity or connectedness in musicians or nonmusicians. Musical proficiency was negatively related to authenticity and song evaluation. The correlation with authenticity likely arose because musicians evaluated the activity as inauthentic while nonmusicians' appraisals of authenticity were not different than neutral. Overall, participants preferred normal music listening over listening to the AI songs. Importantly, agency mediated the effects of task engagement and emotional expression on authenticity, creativity and connectedness. Thus, these results motivate more research on the role of agency in human–AI co-creation and its relation with authenticity, creativity, and connectedness.

Acknowledgments

Funding was received from the European Research Council under the European Union's (EU) Horizon Europe research and innovation programme (grant agreement No. 101045747) for 2022-2027. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the EU or the European Education and Culture Executive Agency (EACEA). Neither the EU nor EACEA can be held responsible for them. Feedback was supported by the Research Council of Norway through its Centres of Excellence scheme (project number 262762).

6. REFERENCES

[1] WHO, "World mental health today: Latest data," Tech. Rep., 2025.

[2] J. Kim and B. Peun, "A Scoping Review of Therapeutic Songwriting: Target Populations and Purposes," *Journal of Music and Human Behavior*, vol. 22, no. 2, pp. 1–26, Aug. 2025. [Online]. Available: https://doi.org/10.21187/JMHB.2025.22.2.001

[3] J. Dweck, "Children as Songwriters: The Social-Emotional Benefits of Songwriting in the Elementary Grades," *Research Studies in Music Education*, vol. 46, no. 2, pp. 217–229, 2024. [Online]. Available: https://www.proquest.com/docview/3099833103?accountid=11774&bdid=105415&_bd=FIXT6H9JZHnCnZLoesVFYqCryFI%3D

[4] Y. Jin, W. Cai, L. Chen, Y. Zhang, G. Doherty, and T. Jiang, "Exploring the Design of Generative AI in Supporting Music-based Reminiscence for Older Adults," in *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems*, ser. CHI '24. New York, NY, USA: Association for Computing Machinery, May 2024, pp. 1–17. [Online]. Available: https://dl.acm.org/doi/10.1145/3613904.3642800

[5] R.-E. Palade, I. Marin, N. Goga, A.-M. Comeagă, R. Popovici, F. Popovici, F. Tacea, M. Goga, and A. Dinu, *Artificial Intelligence-Generated Music in Patient Treatment*, Jun. 2025.

[6] D. Williams, V. J. Hodge, and C.-Y. Wu, "On the use of AI for Generation of Functional Music to Improve Mental Health," *Frontiers in Artificial Intelligence*, vol. 3, p. 497864, Nov. 2020. [Online]. Available: https://www.frontiersin.org/articles/10.3389/frai.2020.497864/full

[7] H. Yu, J. A. Evans, D. Gallo, A. J. Kruse, W. M. Patterson, and L. R. Varshney, "AI-Aided Co-Creation for Wellbeing," in *12th International Conference on Computational Creativity*, 2021.

[8] J. Ruiz-Vanoye, A. Fuentes-Penna, R. A. Barrera-Cámara, O. Díaz-Parra, F. R. Trejo-Macotela, J. Aguilar-Ortiz, M. Ruiz Jaimes, and Y. Toledo-Navarro, "Artificial Intelligence and Human Well-Being: A Review of Applications and Effects on Life Satisfaction through Synthetic Happiness," *International Journal of Combinatorial Optimization Problems and Informatics*, vol. 16, pp. 14–37, Feb. 2025.

[9] S. Canyakan, "The role of AI in creative processes: ethical and legal perspectives in the music industry," *Journal of Music Theory and Transcultural Music Studies*, vol. 2, no. 2, pp. 143–158, Dec. 2024. [Online]. Available: https://zenodo.org/records/15031855

[10] E. Deruty, M. Grachten, S. Lattner, J. Nistal, and C. Aouameur, "On the Development and Practice of AI Technology for Contemporary Popular Music Production," *Transactions of the International Society for Music Information Retrieval*, vol. 5, no. 1, Feb. 2022. [Online]. Available: https://transactions.ismir.net/articles/10.5334/tismir.100

[11] Y. Fu, M. Newman, L. Going, Q. Feng, and J. H. Lee, "Exploring the Collaborative Co-Creation Process with AI: A Case Study in Novice Music Production," in *Proceedings of the 2025 ACM Designing Interactive Systems Conference*. Madeira Portugal: ACM, Jul. 2025, pp. 1298–1312. [Online]. Available: https://dl.acm.org/doi/10.1145/3715336.3735829

[12] R. Louie, A. Coenen, C. Z. Huang, M. Terry, and C. J. Cai, "Novice-AI Music Co-Creation via AI-Steering Tools for Deep Generative Models," in *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, ser. CHI '20. New York, NY, USA: Association for Computing Machinery, Apr. 2020, pp. 1–13. [Online]. Available: https://dl.acm.org/doi/10.1145/3313831.3376739

[13] W. He, "Subjective task load and psychological ownership in generative AI collaborative music creation: mechanisms shaping creators' state sense of agency," *Frontiers in Psychology*, vol. 17, p. 1835406, May 2026. [Online]. Available: https://www.frontiersin.org/articles/10.3389/fpsyg.2026.1835406/full

[14] M. Riaz, Erdem, and A. R. Jensenius, "Inverse and indirect mappings in embodied AI systems in everyday environments," *Frontiers in Computer Science*, vol. 7, Jan. 2026. [Online]. Available: https://www.frontiersin.org/journals/computer-science/articles/10.3389/fcomp.2025.1603769/full

[15] S. Saarikallio, "Access-Awareness-Agency (AAA) Model of Music-Based Social-Emotional Competence (MuSEC)," *Music & Science*, vol. 2, p. 2059204318815421, Jan. 2019. [Online]. Available: https://doi.org/10.1177/2059204318815421

[16] L. Wu, M. Spieß, and M. Lehmann, "The effect of authenticity in music on the subjective theories and aesthetical evaluation of listeners: A randomized experiment," *Musicae Scientiae*, vol. 21, no. 4, pp. 442–464, Dec. 2017. [Online]. Available: https://journals.sagepub.com/doi/10.1177/1029864916676301

[17] M. Avdeeff, "Artificial Intelligence & Popular Music: SKYGGE, Flow Machines, and the Audio Uncanny Valley," *Arts*, vol. 8, no. 4, p. 130, Oct. 2019. [Online]. Available: https://www.mdpi.com/2076-0752/8/4/130

[18] A. Moore, "Authenticity as authentication," *Popular Music*, vol. 21, no. 2, pp. 209–223, May 2002. [Online]. Available: https://www.cambridge.org/core/product/identifier/S0261143002002131/type/journal_article

[19] P. Auslander, *Liveness: Performance in a Mediatized Culture*, 3rd ed. London: Routledge, Oct. 2022. [Online]. Available: https://www.taylorfrancis.com/books/9781003031314

[20] K. E. Onderdijk, D. Swarbrick, B. Van Kerrebroeck, M. Mantei, J. K. Vuoskoski, P.-J. Maes, and M. Leman, "Livestream Experiments: The Role of COVID-19, Agency, Presence, and Social Context in Facilitating Social Connectedness," *Frontiers in Psychology*, vol. 12, p. 647929, May 2021. [Online]. Available: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.647929/full

[21] D. Swarbrick and S. Saarikallio, "An Exploratory Study on How AI Song Generation Affects Emotions, Agency, Authenticity, Creativity, and Connectedness in Musicians and Nonmusicians (Spotlight Presentation and Poster)," in *SEMPRE PGR/ECR*, Cambridge, UK, Apr. 2026.

[22] J. D. Zhang and E. Schubert, "A Single Item Measure for Identifying Musician and Nonmusician Categories Based on Measures of Musical Sophistication," *Music Perception*, vol. 36, no. 5, pp. 457–467, Jun. 2019. [Online]. Available: https://online.ucpress.edu/mp/article/36/5/457/62686/A-Single-Item-Measure-for-Identifying-Musician-and

[23] A. Schepman and P. Rodway, "The General Attitudes towards Artificial Intelligence Scale (GAAIS): Confirmatory Validation and Associations with Personality, Corporate Distrust, and General Trust," *International Journal of Human–Computer Interaction*, vol. 39, no. 13, pp. 2724–2741, Aug. 2023. [Online]. Available: https://www.tandfonline.com/doi/full/10.1080/10447318.2022.2085400

[24] C. Small, "Musicking — the meanings of performing and listening. A lecture," *Music Education Research*, vol. 1, no. 1, pp. 9–22, Mar. 1999. [Online]. Available: http://www.tandfonline.com/doi/full/10.1080/1461380990010102